

WHAT IS CLAIMED IS:

1. A semiconductor device comprising a vertical MOSFET that uses SiC, wherein a base region of the vertical MOSFET has a tapered shape.
2. The semiconductor device according to claim 1, wherein the taper angle of the base region of the vertical MOSFET set to an angle of 30° or more and 60° or less.
3. A method of manufacturing a semiconductor device, wherein in manufacture of a vertical MOSFET that uses SiC, a source region and a base region are formed by ion implantation using the same mask.
4. The method of manufacturing a semiconductor device according to claim 3, wherein the same mask has a tapered shape that is tapered at an angle of 30° or more and 60° or less, and is formed from a material that equals SiC in terms of range in ion implantation.
5. The method of manufacturing a semiconductor device according to claim 3, wherein the same mask has a tapered shape that is tapered at an angle of 20° or more and 45° or less, and is formed from SiO₂.
6. The method of manufacturing a semiconductor device according to claim 3, wherein in the ion implantation, ions are implanted perpendicular and obliquely with

respect to a substrate.

7. The method of manufacturing a semiconductor device according to claim 6, wherein the same mask is formed from a material that is longer than SiC in terms of range in ion implantation.

8. The method of manufacturing a semiconductor device according to claim 6, wherein the same mask is formed from a material that equals SiC in terms of range in ion implantation, and the ion implantation angle is set to 70° or less.

9. The method of manufacturing a semiconductor device according to claim 6, wherein the same mask is formed from SiO₂, and wherein the ion implantation angle is set to 75° or less.

10. The method of manufacturing a semiconductor device according to claim 3, wherein in the ion implantation, ions are implanted obliquely with respect to a substrate, and the ion implantation angle with respect to the substrate is smaller in the base region than in the source region of the vertical MOSFET.

11. The method of manufacturing a semiconductor device according to claim 6, wherein ions are implanted using the same mask having a tapered shape.

12. The method of manufacturing a semiconductor device according to claim 10, wherein ions are implanted using the same mask having a tapered shape.